

**WHAT IS CLAIMED IS:**

1. An isolated and purified nucleic acid encoding a polypeptide comprising the sequence of SEQ ID NO:1 (Fab1 Human AA).
2. The isolated and purified nucleic acid of claim 1, wherein the nucleic acid comprises the sequence of SEQ ID NO:2 (Fab1 Human DNA).
3. An isolated and purified nucleic acid encoding a polypeptide comprising the sequence of SEQ ID NO:3 (Vac14 Human AA).
4. The isolated and purified nucleic acid of claim 3, wherein the nucleic acid comprises the sequence of SEQ ID NO:4 (Vac14 Human DNA).
5. An isolated and purified nucleic acid encoding a polypeptide comprising the sequence of SEQ ID NO:5 (Fig4 Human AA).
6. The isolated and purified nucleic acid of claim 1, wherein the nucleic acid comprises the sequence of SEQ ID NO:6 (Fig4 Human DNA).
7. An isolated and purified nucleic acid encoding a polypeptide comprising the sequence of SEQ ID NO:7 (Vac14 yeast AA).
8. The isolated and purified nucleic acid of claim 1, wherein the nucleic acid comprises the sequence of SEQ ID NO:8 (Vac14 yeast DNA).
9. An expression construct comprising a promoter active in eukaryotic cells, said promoter operably linked to a nucleic acid segment encoding a polypeptide comprising the sequence of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 or SEQ ID NO:7.
10. An oligonucleotide of between about 10 and about 50 bases, said oligonucleotide comprising at least about 10 consecutive bases of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 or SEQ ID NO:7.

11. The oligonucleotide of claim 10, wherein said oligonucleotide is 10, 15, 20, 25, 30, 35, 40, 45 or 50 bases in length.
12. The oligonucleotide of claim 10, wherein the number of consecutive bases is 10, 15, 20, 25, 30, 35, 40, 45 or 50 bases.
13. A recombinant cell comprising an expression cassette comprising a promoter active in eukaryotic cells, said promoter operably linked to a nucleic acid segment encoding a polypeptide comprising the sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6 or SEQ ID NO:8, said promoter also being heterologous to said nucleic acid segment.
14. The recombinant cell of claim 13, wherein said expression cassette is comprised in an episomal element.
15. The recombinant cell of claim 13, wherein said expression cassette is integrated into the cellular genome.
16. An isolated and purified polypeptide comprising the sequence of SEQ ID NO:1 (Fab1 Human AA).
17. The isolated and purified polypeptide of claim 16, wherein said polypeptide is a fusion protein further comprising additional non-human Fab1 sequences.
18. An isolated and purified polypeptide comprising the sequence of SEQ ID NO:3 (Vac14 Human AA).
19. The isolated and purified polypeptide of claim 18, wherein said polypeptide is a fusion protein further comprising additional non-human Vac14 sequences.
20. An isolated and purified polypeptide comprising the sequence of SEQ ID NO:5 (Fig4 Human AA).
21. The isolated and purified polypeptide of claim 20, wherein said polypeptide is a fusion protein further comprising additional non-Fig4 sequences.

22. An isolated and purified polypeptide comprising the sequence of SEQ ID NO:7 (Vac14 yeast AA).
23. The isolated and purified polypeptide of claim 22, wherein said polypeptide is a fusion protein further comprising additional non-yeast Vac14 sequences.
24. An oligopeptide of between about 5 and about 30 residues, said oligopeptide comprising at least about 5 consecutive residues of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 or SEQ ID NO:7.
25. The oligopeptide of claim 24, wherein said oligopeptide is 5, 10, 15, 20, 25, or 30 residues in length.
26. The oligopeptide of claim 24, wherein the number of consecutive residues is 5, 10, 15, 20, 25, or 30.
27. A monoclonal antibody that binds immunologically to a polypeptide comprising the sequence of SEQ ID NO:1 (Fab1 Human AA), the sequence of SEQ ID NO:3 (Vac14 Human AA), the sequence of SEQ ID NO:5 (Fig4 Human AA), or the sequence of SEQ ID NO:7 (Vac14 yeast AA).
28. A polyclonal antisera, antibodies of which bind immunologically to a polypeptide comprising the sequence of SEQ ID NO:1 (Fab1 Human AA), the sequence of SEQ ID NO:3 (Vac14 Human AA), the sequence of SEQ ID NO:5 (Fig4 Human AA), or the sequence of SEQ ID NO:7 (Vac14 yeast AA).
29. A non-human transgenic animal, cells of which comprise expression cassette comprising a promoter active in eukaryotic cells, said promoter operably linked to a nucleic acid segment encoding a polypeptide comprising the sequence of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5 or SEQ ID NO:7, said promoter also being heterologous to said nucleic acid segment.
30. A non-human transgenic animal, cells of which exhibit a defect in the expression of a Fab1, Vac14 or Fig4 polypeptide.

31. The non-human transgenic animal of claim 30, wherein said cells exhibit reduced expression of Fab1, Vac14 or Fig4 polypeptide.
32. The non-human transgenic animal of claim 30, wherein said cells exhibit expression of a reduced-function or non-functional Fab1, Vac14 or Fig4 polypeptide.
33. A method of identifying a subject at risk of developing diabetes comprising assessing the structure, function or expression of Fab1, Vac14 and/or Fig4 in cells of said subject.
34. The method of claim 33, wherein assessing comprises assessing expression.
35. The method of claim 34, wherein assessing expression comprises Northern blotting.
36. The method of claim 34, wherein assessing expression comprises quantitative RT-PCR.
37. The method of claim 34, wherein assessing expression comprises Western blotting.
38. The method of claim 34, wherein assessing expression comprises quantitative immunohistochemistry.
39. The method of claim 33, wherein assessing comprises assessing activity.
40. The method of claim 39, wherein assessing activity comprises measuring PI(3,5)P<sub>2</sub>.
41. The method of claim 40, wherein assessing activity comprises measuring PI(3,5)P<sub>2</sub> turnover.
42. The method of claim 40, wherein assessing activity comprises measuring PI(3,5)P<sub>2</sub> steady state levels.

43. The method of claim 40, wherein assessing activity comprises measuring PI(3,5)P<sub>2</sub> synthesis.
44. The method of claim 40, wherein assessing activity comprises measuring PI(3)P.
45. The method of claim 39, wherein assessing activity comprises measuring protein kinase activity.
46. The method of claim 33, wherein assessing comprises assessing structure.
47. The method of claim 46, wherein assessing structure comprises nucleic acid sequencing.
48. The method of claim 47, wherein sequence comprises PCR.
49. The method of claim 47, wherein sequence comprises RT-PCR.
50. The method of claim 469, wherein assessing structure comprises measuring antibody binding.
51. The method of claim 50, wherein measuring antibody binding comprises, RIA, ELISA, Western blot or immunohistochemistry.
52. The method of claim 46, wherein assessing structure comprises high stringency nucleic acid hybridization.
53. The method of claim 33, further comprising obtaining a cell from said subject.
54. The method of claim 53, wherein said cell is a kidney cell, a liver cell, a leukocyte, an adipocyte, or a muscle cell.
55. The method of claim 53, further comprising subjecting said cell to stress prior to assessing expression or activity.
56. The method of claim 55, wherein stress is osmotic stress.

57. The method of claim 55, further comprising subjecting said cell to hormonal stimulation prior to assessing expression or activity.
58. The method of claim 57, wherein said hormonal stimulation is insulin stimulation.
59. A method of screening a candidate compound for their ability to increase glucose uptake comprising:
  - (a) providing a insulin-responsive cell;
  - (b) contacting said insulin-responsive cells with said candidate compound; and
  - (c) measuring the change in PI(3,5)P<sub>2</sub> in said cell.
60. The method of claim 49, wherein said insulin-responsive cell is an adipocyte or a muscle cell.